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LPS- Pulmonary Inflammation

LPS- Systemic Inflammation  
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Tail Suspension  
Tail Immersion and Tail Flick  
von Frey/Carrageenan Sensitivity  
Weight Gain

## Cardiovascular:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Bleeding Time</a> *	Heparin	Time to bleeding cessation	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Blood Pressure Tail Cuff</a>	Candesartan	Blood pressure and heart rate	Rat	Short lead time required, Group size n>12
<a href="#">Telemetry</a>	Candesartan	SHR Rats Blood Pressure/ MAP Heart Rate Locomotor and Open-field activity	Hamster, Mouse, Rat	Surgically complex

## Fibrosis:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Liver Fibrosis</a>	N/A	TBD	Mouse	In development
<a href="#">Pulmonary Fibrosis</a>	N/A	TBD	Mouse	In development
<a href="#">Wound Healing</a> *	N/A	Latency to heal an 8mm skin biopsy punch	Mouse	Short lead time required, No positive control available

## Gastrointestinal:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Acetylcholine Writhing</a> *	Morphine	Time to writhing onset Number of writhes	Mouse	Short lead time required, Good reproducibility
<a href="#">Colonic Propulsion</a> *	Morphine	Latency to colonic expulsion of glass bead	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">DSS- Model of Colitis</a> *	Cyclosporine A	Body weight Gastrointestinal distress	Mouse	Short lead time required, Good reproducibility
<a href="#">Fecal Accumulation</a> *	N/A	Charcoal transit distance and time	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Gastrointestinal Transit</a> *	Morphine	Intestinal distance travelled of gavage-administered charcoal bolus	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Morphine-Induced Constipation</a> *	Naloxone	Latency of colonic expulsion of glass bead	Mouse, Rat	Short lead time required, Good reproducibility

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## *in vivo* assay capabilities

### Hair Growth and Dermatitis:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Contact Dermatitis*</a>	Dexamethasone	Swelling of ears sensitized to oxazolone, PPD or DNFB; Clinical evaluation of ear redness, Cytokine/IL levels in ear biopsies, INF- $\gamma$	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Chronic Contact Hypersensitivity*</a>	Tacrolimus	Swelling of ears chronically challenged with DNFB, Clinical evaluation of ear redness, Scratching behavior in response to challenge, Cytokine/IL levels in ear biopsies, INF- $\gamma$	Mouse	Chronic model
<a href="#">Delayed-Type Hypersensitivity*</a>	Dexamethasone	Footpad thickness after immunogenic challenge measured by digital caliper	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Hair Growth Assay</a>	Minoxidil	Hair growth score, Time and magnitude	Mouse	Chronic Model
<a href="#">Pruritis Scratching Model</a>	U-50,488	Scratching behavior after chloroquine challenge	Mouse	Short lead time required, Good reproducibility
<b>Sebum Production *</b>	N/A	Sebum production, Fur water retention	Mouse	No positive control available

### Inflammation and Arthritis:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Acute Nephritis Model</a>	Cisplatin, PAG	Altered blood and urine chemistries, Histological evidence of kidney tubule damage and inflammatory cell infiltration	Mouse	Short lead time required
<a href="#">Acute Pancreatitis Model</a>	Caerulein, PAG	Increased serum amylase and pancreatic myeloperoxidase (MPO), Histological evidence of alveolar thickening and inflammatory cell infiltration	Mouse	Short lead time required
<a href="#">Capsaicin Analgesia Assay</a>	Morphine	Pain responsiveness after capsaicin inflammation	Rat	Short lead time required, Good reproducibility

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<a href="#">Chronic Contact Hypersensitivity</a> *	Tacrolimus	Swelling of ears chronically challenged with DNFB, Clinical evaluation of ear redness Scratching behavior in response to challenge Cytokine/IL Levels in ear biopsies, INF- $\gamma$	Mouse	Chronic model
<a href="#">Collagen Induced Arthritis</a> *	Dexamethasone	Clinical evaluation of paw and joint inflammation	Mouse, Rat	Strain Sensitive, Short lead time required, Good reproducibility
<a href="#">Contact Dermatitis</a> *	Dexamethasone	Swelling of ears sensitized to oxazolone, PPD, or DNFB; Clinical evaluation of ear redness, Cytokine/IL levels in ear biopsies, INF- $\gamma$	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Delayed Type Hypersensitivity</a> *	Dexamethasone	Footpad thickness after immunogenic challenge measured by digital caliper	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Experimental Autoimmune Encephalomyelitis (EAE)</a> *	FTY 720	Clinical Scores, Body weight	Mouse, Rat	Strain and supplier sensitive, Good reproducibility
<a href="#">Formalin Analgesia Assay</a> *	Oxycodone	Duration of Phase I (acute) pain, Duration of Phase II (delayed) pain	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">LPS – Pulmonary Inflammation</a> *	Dexamethasone	Cytokine and MCP-1 levels in dissected lung tissue, Cellular infiltrate analysis	Mouse, Rat	Acute model, Short lead time required, Good reproducibility
<a href="#">LPS – Systemic Inflammation</a> *	Dexamethasone	TNF- $\alpha$ and IL-6 blood levels after lipopolysaccharide challenge	Mouse, Rat	Acute model, Short lead time required, Good reproducibility
<a href="#">Monocyte Infiltration</a> *	Dexamethasone	MCP-1 levels from peritoneal lavage, Differentials	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Pulmonary Inflammation</a> *	Dexamethasone	Cytokine and MCP-1 levels in dissected lung tissue, Cellular infiltrate analysis	Mouse, Rat	<i>Ovalbumin</i> Chronic Model, Short lead time required, Good reproducibility
<a href="#">von Frey/Carrageenan Sensitivity</a> *	Indomethacin	Pain responsiveness after carrageenan inflammation	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Zymosan-A Induced Peritonitis</a>	Prednisone	Zymosan-A induces leukocyte accumulation in the peritoneum	Mouse	Short lead time required, Good reproducibility

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# *in vivo* assay capabilities

## Metabolic:

Assay	Validating Compound	Parameters	Species	Comments
<b>Cold Sensitivity</b>	Reserpine	Core body temperature in response to cold exposure	Mouse	Unique assay
<a href="#">db/db Mouse Model</a>	Rosiglitazone	Multiple parameters: Chronic Glucose, hormones, HbA1c, pancreatic insulin, IHC	Mouse	Chronic, Good reproducibility
<a href="#">DEXA (High Fat Diet) *</a>	N/A	Bone parameters and body composition (fat and lean) parameters	Mouse	Coupled with high fat diet, Good reproducibility
<a href="#">Diabetic Neuropathy- Streptozotocin Rat Model</a>	N/A	Development of mechanical and thermal neuropathies in STZ-treated rats	Rat	Chronic study, Highly specialized study
<a href="#">Diet-Induced Obesity/High-Fat Diet *</a>	Rimonabant	Quantity of food ingested per day and per gram of body weight, Weight change over time, Weight change from initial measurement, DEXA analysis, Serum markers for Leptin, Insulin and Adiponectin	Mouse, Rat	Can be coupled with multiple assays, Short lead time required, Good reproducibility
<a href="#">Euglycemic/Hyperglycemic Clamp Study</a>	Rosiglitazone	Hyperinsulinemic euglycemic clamp, Glucose infusion rate to maintain euglycemia with constant insulin infusion rate	Mouse, Rat	Gold standard measure of insulin sensitivity
<a href="#">Food Intake *</a>	Imipramine	Quantity of food ingested per day and per gram of body weight, Food ingested after fasting	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Insulin Tolerance Test (ITT)*</a>	Insulin	Glucose response to insulin	Mouse, Rat	Can be coupled with multiple assays, Short lead time required, Good reproducibility
<b>Metabolic Hormone Levels *</b>	Rimonabant	Leptin, insulin adiponectin, c-peptide, etc in response to multiple challenges (high fat diet, drug treatment, acute/chronic)	Mouse, Rat	Coupled with multiple metabolic assays, Short lead time required, Good reproducibility
<a href="#">ob/ob Mouse Model</a>	Rosiglitazone	Multiple parameters: chronic glucose, hormones, HbA1c, pancreatic insulin, IHC	Mouse	Chronic, Good reproducibility

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## *in vivo* assay capabilities

<a href="#">Oral Glucose Tolerance Test (OGTT)</a> *	Metformin	Glucose levels over a trial period after glucose challenge, Pre/Post- High fat diet regimen	Mouse, Rat	Can be coupled with high fat diet model, Short lead time required, Good reproducibility
<a href="#">Streptozotocin-Induced Diabetes</a>	Insulin	Multiple parameters, Chronic glucose, hormones, HbA1c, Diuresis and Nephropathy	Mouse, Rat	Metabolic Type I Diabetes, Highly specialized, Well - characterized
<a href="#">Stress-Induced Hyperthermia</a> *	Diazepam	Core body temperature in response to stress	Mouse, Rat	Short lead time required, Good reproducibility
<b>Weight Gain</b> *	Imipramine	Weight change from initial measurement, Weight change per day	Mouse, Rat	Short lead time required, Good reproducibility
<b>ZDF Rats</b>	Insulin	Multiple parameters, Chronic glucose, hormones, HbA1c, pancreatic insulin IHC	Mouse, Rat	Short lead time required, Good reproducibility

### Motor Function:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Electromyography (EMG) C-Fiber Pain Reflex</a>	Morphine	Flexor (C-fiber), Ia, H reflex aptitudes	Rat	Highly specialized capability
<a href="#">Grip Strength</a> *	N/A	Force exerted to hold onto a wire screen	Mouse, Rat	ALS model Fast turn-around time, Can be coupled with other assays
<a href="#">Locomotor and Open-Field Activity</a> *	Diazepam, MK-801	Locomotor parameters in an automated open-field	Mouse, Rat	Typically coupled with other assays, Short lead time required Good reproducibility
<a href="#">Motor Evoked Potentials (CMAP)</a>	N/A	Tibialis anterior and plantaris response latencies, Behavioral evaluation (limb splay, toe spread)	Mouse	ALS model Strain and supplier sensitive, Good reproducibility
<a href="#">Rotarod</a> *	Diazepam, Haloperidol	Coordination, Acceleration	Mouse, Rat	Primarily utilized as pharmacology safety assay

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## Neurology and Neurodegeneration:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">6 Hz Psychomotor Seizure Model</a>	Valproate	Seizure (absence, presence)	Mouse	6 Hz seizure Short lead time, Good reproducibility
<a href="#">6-OHDA Lesion</a>	Amantadine	Rotational behavior, Dopaminergic markers, Dyskinesias (AIMS, FAS)	Rat	Neurodegenerative symptomatic Parkinson's Disease model
<b>APP/PS1 Gene-Targeted Alzheimer's Disease Mouse</b>	N/A	A $\beta$ levels, Plaque deposition, Cognitive behavior	Mouse	Proprietary mouse model of neurodegenerative Alzheimer's disease, Well characterized Strain specific Significant lead time required
<a href="#">Audiogenic Seizure</a>	Diazepam, R-baclofen	Seizure (presence/absence)	Mouse	CNS/ Epilepsy Fragile X Syndrome Fmr1 KO mice Short lead time required, Good reproducibility
<a href="#">Catalepsy</a> *	N/A	Reversal of haloperidol-induced cataleptic response	Mouse	Newly developed
<a href="#">Experimental Autoimmune Encephalomyelitis (EAE)</a> *	FTY 720	Clinical Scores, Body weight	Mouse, Rat	Strain and supplier sensitive, Good reproducibility
<a href="#">FMR1; Fragile X model</a>	Diazepam, R-baclofen	Audiogenic seizure, Startle prepulse inhibition, Open-field activity	Mouse	Neurodegeneration/Autism Breeding limitations,
<a href="#">Maximal Electroshock</a> *	Phenytoin	Seizure (absence, presence)	Mouse	60 Hz Seizure, Short lead time required, Good reproducibility
<a href="#">MPTP-induced Parkinson's Disease</a> *	L-Deprenyl	Locomotor parameters in an automated open-field apparatus, Striatal dopamine levels, Dopamine cell number (TH staining; substantia nigra)	Mouse	Neurodegenerative model of Parkinson's Disease, Strain and supplier sensitive, Short lead time required, Good reproducibility
<a href="#">Pentylentetrazole-Induced Seizures</a> *	Diazepam	Time to initial colonic seizure, Time to initial tonic seizure, EEG measurements	Mouse, Rat	CNS/ Epilepsy, Short lead time required, Good reproducibility

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<b>Rett Syndrome Neurodevelopment Model</b>	N/A	Locomotor, Respiration, Seizure, Mortality	Mouse	Neurodegeneration/Rett Syndrome, Breeding limitations, Significant lead time required
<a href="#">Startle Prepulse Inhibition</a> *	Risperidone	Sensorimotor gating	Mouse	Short lead time required, Good reproducibility, Group sizes n>10

## Neurophysiology:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">C-Fiber Pain Reflex Electromyography (EMG)</a>	Morphine	Flexor (c-fiber), Ia, H reflex amplitudes	Rat	Muscle response, spasticity Highly specialized capability
<a href="#">Cortical EEG Frequency</a>	Diazepam	EEG Power	Mouse, Rat	Highly specialized capability
<a href="#">Cortical Sensory Evoked Potentials</a>	N/A	Cortical response to peripheral sensory stimulus	Rat	Cognitive disorders (Schizophrenia, Stroke, Head Injury), Highly specialized capability
<a href="#">EEG Sleep/Wake and Motor Activity</a>	Caffeine, Modafinil, Pentobarbitol	Sleep architecture, Circadian rhythm, Sleep/wake enhancement, CNS drug side-effects	Mouse, Rat	Highly specialized capability
<a href="#">Motor Evoked Potentials and Nerve Conduction</a>	N/A	Nerve conduction velocity, Neuromuscular function	Rat	ALS (SOD G93A mice), Motor Neuron Diseases, Highly specialized capability
<a href="#">Proprioceptive Spinal Reflexes</a>	N/A	Stimulation of the tibial nerve resulting in M-response and H-reflex	Rat	Highly specialized capability
<a href="#">Pro- and Anti-Convulsant Evaluation</a>	Diazepam, Pentylentetrazole	Sub-clinical seizure threshold in response to seizure-inducing agents	Mouse, Rat	Highly specialized capability
<a href="#">STN Single Unit Recording in 6-OHDA Lesioned Rats</a>	6-OHDA	Atypical neuronal bursting by lesions or deep-brain stimulation	Rat	Parkinsonian model, Highly specialized capability, Significant lead time required
<a href="#">Status Epilepticus Model of Seizure</a>	Diazepam	Lithium-pilocarpine induced seizures Cortical EEG recordings	Rat	Highly specialized capability

## Neuropathic/Pain:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Acetylcholine Writhing</a> *	Morphine	Time to onset of writhing; Number of writhes	Mouse	Short lead time required, Good reproducibility

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## *in vivo* assay capabilities

<a href="#">Capsaicin Analgesia Assay</a>	Morphine	Pain responsiveness after capsaicin inflammation	Rat	Short lead time, Good reproducibility
<b>Chemotherapy-Induced Neuropathy</b>	N/A	Pain response after chemotherapy	Rat	In development
<a href="#">Chronic Constrictive Injury</a>	Gabapentin	Pain responsiveness after sciatic constriction Mechanical and thermal neuropathies	Mouse, Rat	Surgically complex and specialized, Chronic model, Group sizes of n=10
<b>Cold Response</b>	Morphine	Latency to paw withdrawal from cold water bath	Mouse, Rat	Short lead time required, Group sizes n>10
<a href="#">Diabetic Neuropathy – Streptozotocin Rat Model</a>	N/A	Development of mechanical and thermal neuropathies in STZ-treated rats	Rat	Chronic study, Specialized study
<a href="#">Formalin Analgesia Assay</a> *	Oxycodone	Duration of Phase I (acute) pain, Duration of Phase II (delayed) pain	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Hargreaves</a>	Morphine	Radiant heat response	Mouse, Rat	Short lead time required, Good reproducibility Group size n>10
<a href="#">Hot Plate Analgesia Assay</a> *	Morphine	Latency to pain response	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Migraine Model</a>	Sumatriptan	Periorbital pain response after prostaglandin brain infusion	Rat	Newly developed Highly specialized capability
<a href="#">Spinal Nerve Ligation Model</a>	Gabapentin, Morphine	Paw withdrawal threshold after L5 spinal nerve ligation, Mechanical neuropathy	Rat	Newly developed Highly specialized capability
<a href="#">Tail Immersion</a> and <a href="#">Tail Flick</a>	Morphine	Measures spinally-driven aspects of pain, Lamp or tail immersion, Tail heated water bath response	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">von Frey/Carrageenan Sensitivity</a> *	Indomethacin	Pain responsiveness after carrageenan inflammation	Mouse, Rat	Short lead time required, Good reproducibility

### Psychiatric and Cognitive:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Chronic Mild Stress – Tail Suspension Test, Corticosterone Levels</a>	Desipramine	Response in depression assay after chronic stress	Mouse	Chronic Study, Specialized Study

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## *in vivo* assay capabilities

<a href="#">Elevated Plus Maze</a>	Diazepam	Time in open vs. closed arms	Rat	Short lead time required, Good reproducibility, Group sizes n>10
<a href="#">Fear Conditioning</a>	Rolipram	Contextual memory Cued fear conditioning freezing behavior	Mouse, Rat	Group sizes n>10 Strain specific
<a href="#">Forced Swim Test</a> *	Imipramine	Duration of behavioral despair	Mouse	Short lead time required, Good reproducibility, Group size n>8
<a href="#">Light Dark Transitions</a> *	Diazepam	Ratio of time in light and dark spaces Number of light dark transitions	Mouse	Group sizes n>10
<a href="#">Novel Environment Feeding Suppression</a>	Imipramine	Assesses stress-induced anxiety in measuring latency to eat	Mice	Group sizes n>10
<a href="#">Novel Object Recognition Test</a>	Scopolamine, D-Serine	Cognition, Recognition index	Mouse, Rat	Inter-experiment variability
<a href="#">Open-Field Activity</a> *	MK-801	Locomotor parameters in an automated open-field	Mouse, Rat	Typically coupled with other assays, Short lead time required Good reproducibility
<a href="#">Restraint Stress – Corticosterone Levels</a>	Desipramine Fluoxetine	Corticosterone levels after physical and/or immunological stress, Coupled stress-induced fecal output	Mouse, Rat	Chronic study, Good reproducibility
<a href="#">Rotarod</a> *	Diazepam, other	Coordination, Acceleration	Mouse, Rat	Primarily utilized as pharmacology safety assay
<a href="#">Social Recognition</a>	Armodafinil	Short-term memory difference, Interaction between adults and familiar vs. novel juvenile rats	Rat	Specialized study
<a href="#">Startle Prepulse Inhibition</a> *	Risperidone	Sensorimotor gaiting	Mouse	Short lead time required, Good reproducibility, Group sizes n>10
<a href="#">Stress-Induced Fecal Production</a> *	N/A	Fecal counts after restraint stress, Coupled with corticosterone levels	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Stress-induced Hyperthermia</a>	Diazepam	Core body temperature in response to stress	Mouse, Rat	Short lead time required, Good reproducibility
<a href="#">Tail Suspension</a> *	Imipramine	Duration of behavioral despair	Mouse	Short lead time required, Good reproducibility Group size n>10

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## *in vivo* assay capabilities

<b>Telemetry: Home cage activity</b>	N/A	Multiple home cage activities, Locomotion, Core body temperature	Mouse, Rat	Fast turn-around, Typically coupled with other assays
<a href="#">Vogel Water Conflict</a>	Diazepam	Avoidance behavior to shock	Rat	Newly developed, Group sizes n>10

### Urogenital:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Micturition – Diuretic-Induced Stress</a> *	Oxybutynin	Urinary latency, frequency, And volume	Mouse, Rat	Short lead time required, Good reproducibility

Additional information, including validation data, may be found on the [Melior Discovery](#) website.

## Drug Abuse Liability:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Conditioned Place Preference</a>	Amphetamine, Nicotine/Varenicline	Preference score (seconds)	Mouse, Rat	Variable duration depending upon training paradigm selected
<a href="#">Drug Discrimination</a>	Amphetamine, Nicotine/Varenicline	Response rate (lever press)	Mouse, Rat	Variable duration depending upon training paradigm selected
<a href="#">Locomotor Sensitization</a>	Amphetamine, Nicotine/Varenicline	Locomotor activity following drug administration over a 2-week period	Mouse, Rat	An early indicator of abuse liability
<a href="#">Self Administration</a>	Amphetamine, Nicotine/Varenicline	Rate of self-administration events following a training period	Mouse, Rat	A gold standard model of abuse potential, Longer duration required for training paradigm

## Seizure Potential:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">6 Hz Psychomotor Seizure Model</a>	Valproate	Seizure (absence, presence)	Mouse	6 Hz seizure Good lead time, Good reproducibility
<a href="#">Audiogenic Seizure</a>	Diazepam, R-baclofen	Seizure (absence, presence)	Mouse	CNS/Epilepsy Fragile X Syndrome Model Fmr1 KO mice Short lead time required, Good reproducibility
<a href="#">EEG Pro- and Anti-Convulsant Evaluation</a>	Diazepam, Pentylentetrazole	Sub-clinical seizure threshold in response to seizure-inducing agents	Mouse, Rat	Highly specialized capability
<a href="#">Maximal Electroshock</a> *	Phenytoin	Seizure (absence, presence)	Mouse	60 Hz seizure, Short lead time required, Good reproducibility
<a href="#">Pentylentetrazole-Induced Seizures</a> *	Diazepam	Time to initial clonic seizure, Time to initial tonic seizure, EEG measurements	Mouse, Rat	CNS/ Epilepsy, Short lead time required, Good reproducibility
<a href="#">Status Epilepticus Model of Seizure</a>	Diazepam	Lithium-pilocarpine induced seizures, Cortical EEG recordings	Rat	Highly specialized capability

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## drug safety capabilities

### General Safety Assessment:

Assay	Validating Compound	Parameters	Species	Comments
<a href="#">Irwin Observational Battery</a> *	Diazepam	Clinical evaluation of neurobiological and physiological parameters	Mouse, Rat	Can be used as safety pharm assay or to interpret other responses
<a href="#">Open-Field Activity</a> *	MK-801	Locomotor parameters in an automated open-field	Mouse, Rat	Typically coupled with other assays, Short lead time required Good reproducibility
<a href="#">Rotarod</a> *	Diazepam, other	Coordination, Acceleration	Mouse, Rat	Primarily utilized as pharmacology safety assay

## *general analyses*

### General Analyses:

Assay	Validating Compound	Parameters	Species	Comments
<b>Blood Analysis *</b>	N/A	Standard blood differential	Mouse, Rat	Standard
<b>Clinical Chemistries *</b>	N/A	Standard clinical chemistries	Mouse, Rat	Standard